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BRIEFER ARTICLES.

SELECTED NOTES. III.

(WITH SEVENTEEN FIGURES)

EQUISETUM ARVENSE L.—Though Hofmeister[1] has described in detail the sprouting spores of *Equisetum limosum* and *E. arvense*, his figures of the latter are not so full but that another series might be of interest; especially as the method of development varies so greatly in this species. I have followed carefully the young prothallia of *E. arvense* during a month of growth, and the figures here given illustrate their progress from day to day. In both *E. limosum* and *E. arvense*, Hofmeister finds that almost without exception there is first cut off in the germinating spore a comparatively colorless basal cell, which generally gives rise to the first rhizoid. In *E. arvense*, however, he finds that there are numerous exceptions to this, the small basal cell often not elongating into a rhizoid, but remaining unchanged, while the large cell above produces the rhizoid. This variation was very rare in the spores sprouted by me, but such a case is shown in *fig. 8*. Sometimes (*fig. 6*) the small cell was not cut off, but the rhizoid came directly from the base of the large cell. The first rhizoid is usually the only one for a long time, and in no case did I find another, even in the oldest stages figured. The second wall is as a rule nearly parallel to the first in *E. arvense*, while in *E. limosum*, according to Hofmeister, it is generally perpendicular or strongly inclined to it.

Comparing *figs. 8* and *9*, it will be seen that the greatest possible variation is met with. Both plants shown are of the same age, twenty-three days. The filamentous form (*fig. 8*) is very rare, and is not described by Hofmeister. But Campbell[2] finds that in *E. telmateia* "the first wall may be either vertical or transverse, and sometimes, but not often, there are several transverse walls, and a short filament is formed."[3] *Figs. 10–14* represent plants about one month old. The largest is about old enough to produce antheridia. Later stages were not followed.

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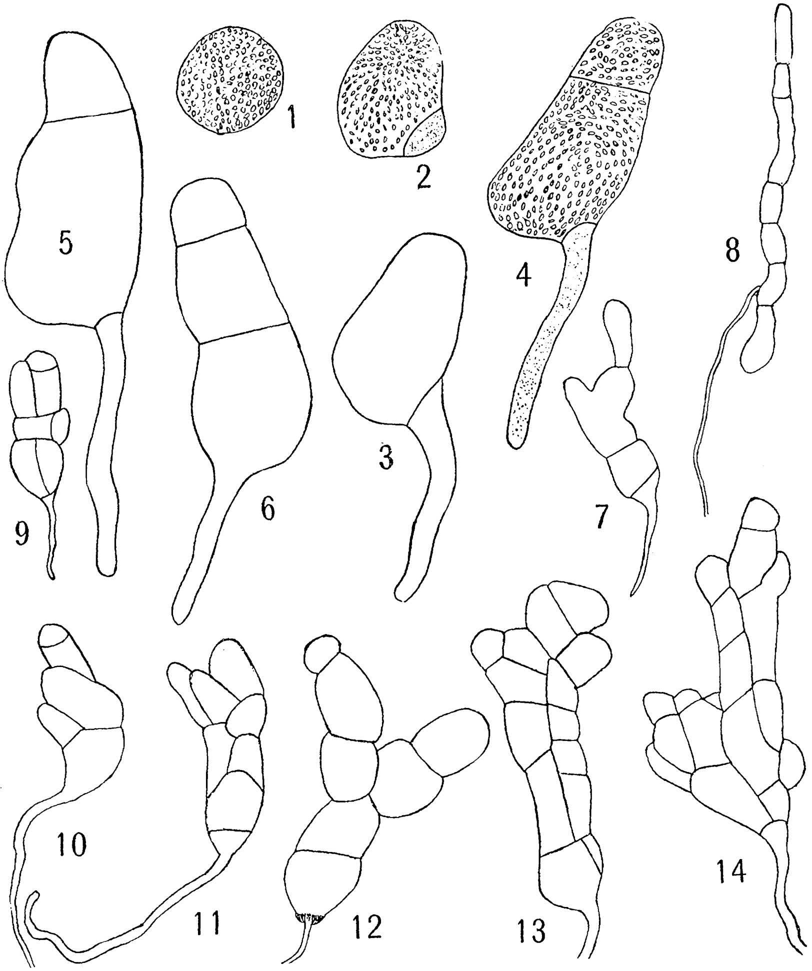
[1] Vergleichende Untersuchungen der höherer Kryptogamen, Leipzig. 1851.

[2] Mosses and Ferns 424.

[3] I have not been able to see the papers of Sadebeck and Buchtien on Equisetum.

MULTISEEDED ACORNS.—Acorns with more than one seed have been described before, but the following striking example may not be unworthy of mention. On the bank of a stream near Baltimore, Md., there is a rock chestnut oak (*Quercus Prinus* L.) that was found to bear acorns which almost invariably contained two or three seeds. One of these acorns is shown sprouting in *fig. 15*. All three young plants are strong and healthy, but one is slightly larger than the others. I have found two young plants coming from an acorn of *Quercus velu-*



FIGS. 1–14.—Different stages of sprouting spores of *Equisetum arvense.*

tina Lam., but other acorns from the same tree showed no such tendency.

CLAVARIA MUCIDA Pers.—This pretty little species has an interesting habit that I have seen referred to only by Morgan,[4] who describes it as "usually growing on a thin greenish stratum, Chlorococcus." I have often found this plant, and it has always been associated with this alga.[5] It generally grows on dead, soggy wood, but often also on alga-covered soil. The habit is shown in *fig. 16.* Atkinson describes and gives a photograph of *C. mucida*,[6] but does not mention its association with the alga. Neither does Hennings in Engler & Prantl's *Pflanzenfamilien*, who says in reference to its habit, "Auf faulenden Holze, seltener auf Erde."

If the basal part of the fungus and the substratum be cut in paraffin or teased under the microscope, it will be seen that the delicate hyphae ramify from the base of the stalk and pass out in all directions among the alga cells. *Figure 17* illustrates the relation between alga and fungus. The hyphae do not enter the alga and have no haustoria, but show about the same loose relation with the alga as in the case of the lichen, Collema. From its constant occurrence and close association with this alga there seems scarcely a doubt that *Clavaria mucida* is in the initial stages of becoming a basidiomycetous lichen.

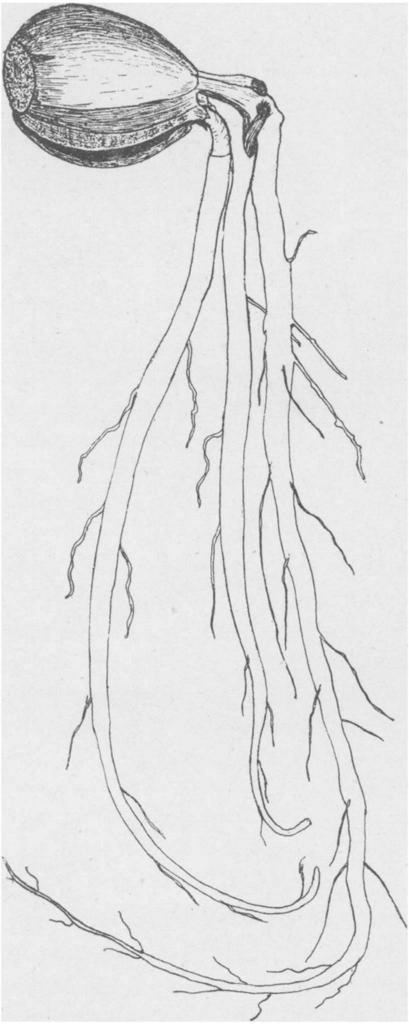


FIG. 15.—Three young plants from one acorn of *Quercus Prinus*. Natural size.

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[4] The mycologic flora of the Miami Valley, Ohio. Jour. Cincinnati Soc. Nat. Hist. 11: 86–95. *pl. 2.* 1888.

[5] I have not carefully identified the alga, and cannot vouch for its being Chlorococcus.

[6] Mushrooms, edible, poisonous, etc. Ithaca. 1900.

Spore distribution in liverworts.—It has no doubt been noticed by all observers of the liverworts that, while terrestrial species have as a rule (Riccia and Sphaerocarpus are exceptions) their capsules raised on elongated stalks furnished either by sporophyte or gametophyte, those which grow on trees seldom elongate their stalks more than enough to free the capsule from the perianth. This difference is plainly due to the fact that the arboricolous species are sufficiently elevated to allow their spores to be well scattered without any special contrivance. It is interesting to note, however, the behavior of the fertile branches of *Porella platyphylla* Lindb. While the vegetative branches of the liverwort remain closely appressed to the bark of the tree, the fertile shoots bend away some time before the spores are ripe, and often project a centimeter or more from the substratum. This exposes the spores to the free play of the wind and no doubt prevents many of them from being caught by the leaves of the mother plant. This habit seems to show that even in arboreal forms it may be an advantage to have the capsule removed some distance from the substratum. It will be noticed here that Porella resembles the Marchantiaceae in giving over to the gametophyte the duty of lifting the capsules.—W. C. Coker, *University of North Carolina, Chapel Hill.*

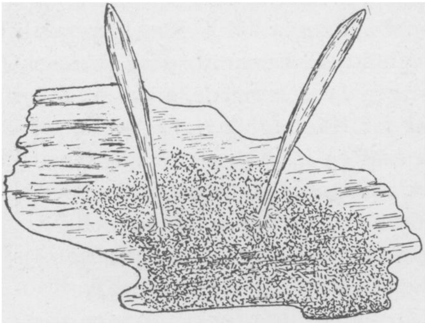

Fig. 16.—*Clavaria mucida*, growing on alga-covered wood. × 5.

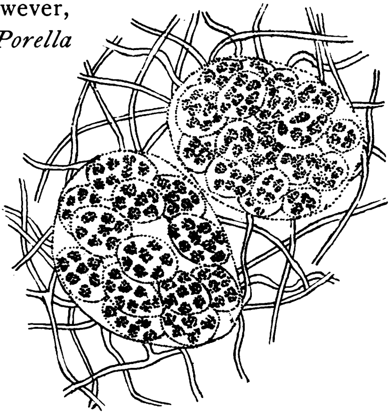

Fig. 17.—*Clavaria mucida.* Hyphae surrounding groups of algae. Highly magnified.

ON THE INTERPRETATION OF THE QUADRIPOLAR SPINDLE IN THE HEPATICAE.

Several papers have appeared recently bearing on the subject of the quadripolar spindle in the Hepaticae, particularly in connection with the genus Pellia. As the writers do not always seem to have